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# NiceZyme View of ENZYME: EC 2.3.2.13

## Official Name

**Protein-glutamine gamma-glutamyltransferase.**

## Alternative Name(s)

**Fibrinoligase.**

**TGase.**

**Transglutaminase.**

## Reaction catalysed

Protein glutamine + alkylamine  $\rightleftharpoons$  protein N(5)-alkylglutamine + NH<sub>3</sub>

## Cofactor(s)

Calcium.

## Comment(s)

The gamma-carboxymide groups of peptide-bound glutamine residues act as acyl donors, and the amino-groups of protein- and peptide-bound lysine residues act as acceptors, to give intra- and intermolecular N(6)-(5-glutamyl)lysine crosslinks.

## Human Genetic Disease(s)

Autosomal recessive  
lamellar ichthyosis (LI) MIM:242300

Factor XIII deficiency MIM:134570

Nonbullous congenital  
ichthyosiform  
erythroderma (NCIE) MIM:242100

## Cross-references

PROSITE PDOC00473

BRENDA 2.3.2.13

PUMA2 2.3.2.13

PRIAM enzyme-  
specific profiles 2.3.2.13

Kyoto University  
LIGAND chemical  
database 2.3.2.13

IUBMB Enzyme  
Nomenclature 2.3.2.13

IntEnz 2.3.2.13

MEDLINE Find literature relating to 2.3.2.13



## ENZYME: 2.3.2.13

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**Entry** EC 2.3.2.13                      Enzyme

**Name** protein-glutamine gamma-glutamyltransferase;  
transglutaminase;  
Factor XIIIa;  
fibrinoligase;  
fibrin stabilizing factor;  
glutamylpeptide gamma-glutamyltransferase;  
polyamine transglutaminase;  
tissue transglutaminase;  
R-glutamyl-peptide:amine gamma-glutamyl transferase

**Class** Transferases  
Acyltransferases  
Aminoacyltransferases

**Sysname** protein-glutamine:amine gamma-glutamyltransferase

**Reaction** protein glutamine + alkylamine = protein N5-alkylglutamine + NH3  
[RN:R03983]

**Substrate** protein glutamine [CPD:C02583]  
alkylamine [CPD:C01664]

**Product** protein N5-alkylglutamine [CPD:C03636]  
NH3 [CPD:C00014]

**Cofactor** Calcium [CPD:C00076]

**Comment** Requires Ca<sup>2+</sup>. The gamma-carboxamide groups of peptide-bound glutamine residues act as acyl donors, and the 6-amino-groups of protein- and peptide-bound lysine residues act as acceptors, to give intra- and inter-molecular N6-(5-glutamyl)-lysine crosslinks. Formed by proteolytic cleavage from plasma Factor XIII

**Pathway** PATH: map04610 Complement and coagulation cascades  
PATH: map05040 Huntington's disease

**Ortholog** KO: K00686 protein-glutamine gamma-glutamyltransferase  
KO: K03917 coagulation factor XIII A1 polypeptide  
KO: K05625 transglutaminase 2

**Genes**

HSA: 116179(TGM7) 2162(F13A1) 2165(F13B) 343641(TGM6) 7047(TGM4)  
7051(TGM1) 7052(TGM2) 7053(TGM3) 9333(TGM5)  
MMU: 14060(F13b) 21816(Tgm1) 21817(Tgm2) 21818(Tgm3) 241636(Tgm6)  
331046(Tgm4) 74145(F13a1) 74176(Tgm5)  
RNO: 56083(Tgm2) 60327(F13a) 60335(Tgm1) 64679(Tgm4)  
BTA: 281528(TGM2) 407997(TGM1)  
DRE: 323856  
DME: CG7356-PA(CG7356)  
BSU: BG10946(tgl)  
BHA: BH3970(tgl)  
BAN: BA4173  
BAR: GBAA4173  
BAA: BA\_4644  
BAT: BAS3875  
BCE: BC3963  
BCZ: BCZK3723(tgl)  
BTK: BT9727\_3708(tgl)  
BLI: BL02523(tgl)